

**Galactin Content of the Rat Pituitary.\***

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We reported<sup>1</sup> that the normal male rat pituitary contains an appreciable amount of the lactogenic hormone and that the injection of the estrogenic hormone definitely increases the galactin content of the pituitary gland.

Employing the same technique as that which we described in the paper referred to above we have extended the study of the galactin content of rat pituitary glands. The results are summarized in Table I.

From the table one can see that as the male rat continues to grow the pituitary gland likewise increases in weight. The bird units of galactin per pituitary gland increase as the animal matures, but this is due largely to the increase in the weight of the gland as one notices that the galactin concentration remains quite constant. The daily injection of 500 international units of Oestroform B into male rats for 7 days increases the weight of the pituitary gland and increases the galactin content of the gland while the content in bird units of galactin per mg. of fresh pituitary tissue remains nearly constant. The injection of thyroxine in increasing dosages decreases the weight of the pituitary glands, decreases the total potency of the glands, and decreases the galactin concentration per mg. of fresh pituitary tissue. The injection of thyroxine at the same level each day, 0.01 mg., produces the same results but to a less extent. Male rats castrated for 60 days possess much larger pituitary glands; the bird units of galactin per pituitary gland, however, remain constant.

The pituitary gland from the immature female rat contains about 3 times the amount of galactin of the immature male rat, this increased galactin content being accompanied by an increased glandular weight and an increased concentration of the galactin. As the female rat matures there is an increase in weight of the pituitary gland as well as an increase in concentration of galactin. At 12 days of pregnancy there is a decrease in the number of bird units

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<sup>1</sup> Reece, R. P., and Turner, C. W., *Proc. Soc. Exp. Biol. and Med.*, 1936, **34**, 402.

TABLE I.  
Galactin Content of the Rat Pituitary.

No. of Animals	Sex	Physiological Condition	Aver. body wt. beginning of exper., gm.	Aver. body wt. when sacrificed gm.	Aver. pituitary wt., mg.	Bird units per pituitary gland	Bird units per 1 mg. pituitary tissue	Bird units per 100 gm. body wt.
10	M	Normal		84	2.0	0.30	.150	0.35
9	M	"	161	176	4.4	0.80	.182	0.45
9	M	500 I.U. of Oestroform B/day for 7 days	161	172	6.2	1.10	.177	0.64
7	M	Normal	149	172	4.9	0.86	.176	0.50
7	M	.01 mg. thyroxine for 7 da., .02 mg. 7 da., .03 mg. 7 da.	150	161	4.0	0.39	.097	0.24
10	M	Normal	309	318	8.1	1.28	.158	0.40
10	M	.01 thyroxine/day for 14 da.	310	312	7.8	1.10	.141	0.35
14	M	Normal	201	239	5.4	1.04	.193	0.44
14	M	Castrated for 60 days	202	239	9.9	1.00	.101	0.42
10	F	Normal		76	3.3	0.94	.284	1.24
14	F	"		170	8.4	3.87	.461	2.27
9	F	12 days pregnant		180	8.1	2.90	.358	1.61
8	F	21 " "		214	7.7	3.50	.455	1.64
11	F	48 hrs. postpartum		201	10.6	7.72	.728	3.84
9	F	10 days " "		206	9.7	5.86	.600	2.84

of galactin per pituitary gland as compared with glands from normal estrous cycle females, and at 21 days pregnancy there is an increase in potency of the glands as compared with those from rats pregnant for 12 days. Forty-eight hours postpartum there is a doubling of the galactin content of the pituitary gland over that of the glands from either the normal estrous cycle female or the female pregnant for 21 days. At 10 days postpartum the galactin content of the glands decreases somewhat, being about midway between the glands from 48 postpartum rats and glands from normal estrous cycle females.

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#### Arbutin Diabetes.

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The site of action of phlorhizin in phlorhizin diabetes is now recognized as being in the kidneys,<sup>1</sup> the disturbance caused by the drug being apparently due to inability of the tubule to reabsorb glucose. This, according to Lundsgaard,<sup>2</sup> arises from the fact that the poisoned tubule is unable to carry out phosphorylation of glucose. Moreover, several glucosides, including phlorhizin, are now known to inhibit phosphorylation *in vitro*, and glucose resorption in the isolated perfused frog kidney is also inhibited.<sup>3</sup> It occurred to us that the glycosuric effect of phlorhizin might be a property common to all these glucosides. The action of arbutin, amygdalin, and salicin on healthy, fasting dogs was studied according to the procedure and methods of urine and blood analyses customary with phlorhizin.

Arbutin is, like phlorhizin, a phenol glucoside. When injected subcutaneously in sterile distilled water twice daily in fasting dogs, it caused a diabetes similar to that produced by phlorhizin with lowered blood sugar and acetone bodies in the urine, the ratio of

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\* These data are to be submitted to the Graduate School of Yale University in partial fulfilment of the requirement for the degree of Doctor of Philosophy.

<sup>1</sup> Deuel, H. J., Jr., Wilson, H. E. C., and Milhorat, A. T., *J. Biol. Chem.*, 1927, **74**, 265.

<sup>2</sup> Lundsgaard, E., *Biochem. Z.*, 1933, **264**, 221.

<sup>3</sup> Abderhalden, E., und Effkeman, G., *Biochem. Z.*, 1934, **268**, 461.